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July 14, 2003

Docket Management Facility
USCG-2002-14134
U.S. Department of Transportation, Room PL-401
400 Seventh Street SW
Washington, DC 20590-0001

Subject: USCG-2002-14134-14: Comments on Draft Environmental Impact Statement (EIS) Prepared for Port Pelican LLC Deepwater Port License Application – LNG Vaporizer System

Dear U.S. Coast Guard:

Thank you for this opportunity to comment on the draft EIS prepared for ChevronTexaco's proposed Port Pelican offshore liquified natural gas (LNG) regasification terminal in the Gulf of Mexico. Our comments relate to the endorsement by the U.S. Coast Guard of "open rack vaporizers" (ORV) for Port Pelican. The ORVs will use up to 176,000,000 gallons/day of seawater to vaporize LNG at Port Pelican. This is approximately the same once-through water demand as that of a 500 MW combined-cycle power plant. As noted in the draft EIS, *". . . the mortality rate for all entrained organisms is expected to be 100 percent*" (pg. 4-16). In contrast, all four existing baseload LNG regasification terminals in the U.S. use "submerged combustion vaporization" (SCV).[1] SCV uses a small portion of the LNG throughput, approximately 1.5 percent, to vaporize the LNG.[2] Emissions of NO_x from the SCVs can be tightly controlled if necessary by the addition of selective catalytic NO_x reduction, as has been done at the Distrigas LNG regasification terminal in suburban Boston.[3]

The U.S. Coast Guard will set the template for future U.S. offshore LNG terminals with the Port Pelican license. This is an excellent opportunity to "get it right the first time."

The draft EIS states, *". . . utilization of best technology available would significantly reduce the loss of marine organisms"* (pg. 4-16). The document further states:

The design and operation of water intake systems have become a concern to the U.S. EPA due to the potential to cause adverse environmental impacts from impingement and entrainment of freshwater and marine life. Section 316(b) of the Clean Water Act states that "the location,

[1] U.S. DOE, U.S. Natural Gas Markets: Mid-Term Prospects for Natural Gas Supply, SR/OIAF/2001-06, December 14, 2001.
[2] Ibid.
[3] Process Engineering Consultants, Distrigas LNG Receiving Terminal High Pressure Expansion Project (HPEP) Description. See website www.shipshim.com/long.htm

design, construction, and capacity of the cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." This requirement is true for both new and existing facilities seeking to renew existing permits." The U.S. EPA considers the best technology available (BTA) to be the "best technology available commercially at an economically practical cost." The cost of economically impractical technology is "wholly disproportionate" to the gained environmental benefit.

Phase I and Phase II of Rule 316(b) deal with power plants. Phase III of Rule 316(b) will address the oil and gas extraction industry. In its industry profile for the oil and gas extraction industry, U.S. EPA states that little is known about potential impacts of impingement and entrainment and further study is required. The EPA is currently conducting a survey of cooling water use in the offshore oil and gas industry (http://www.epa.gov/waterscience/316b/question).

Use of SCV would result in no adverse environmental impacts to marine life. There is no discussion of any kind of SCV in the draft EIS. This is an oversight. Clearly if every existing baseload LNG regasification terminal in the U.S. is using SCV it is economically practical to do so.

Use of SCV also provides a number of distinct benefits to an offshore terminal. It would eliminate the need for an onboard sodium hypochlorite generator. Sodium hypochlorite is the biocide proposed for use in the Port Pelican ORVs. No sodium hypochlorite biocide would be needed if SCV is used. The water vapor produced by the combustion of natural gas in the SCV unit is condensed in the same unit and is available for onboard freshwater requirements. The amount of water condensed in the SCVs will far exceed the 10,000 gallons/day production capacity of the proposed onboard desalination plant.[4] Although some water treatment would be required, use of the fresh water produced in the SCV as the source of onboard potable water would eliminate the need for the desalination plant currently proposed for Port Pelican.

The draft EIS notes that *". . . the ORVs are not a source of air emissions, because they are a closed system and the lift pumps are powered by electricity. Air emissions would result from the operation of the gas turbines used for generating electricity on the Terminal (Port Pelican). These combustion emissions would consist of NO_x, CO, and small amounts of particulate matter and VOCs."* (pg. 4-55). In this case, even the gas turbines are a relatively minor contributor to the overall air emissions associated with the Terminal. According to Table 4-8 (pg. 4-53), air emissions from onboard stationary sources will account for less than 20 percent of the air emissions from the Terminal. The overwhelming majority of air emissions, greater than 80 percent, will be generated by tugboats, supply vessels, and LNG tankers serving the Terminal.

[4] 800 million cubic feet per day of natural gas will be produced by a single LNG regasification train. Assuming 1.5 percent of this gas is combusted in the SCVs and all water vapor produced during combustion is condensed in the SCV, the approximate production rate of freshwater in the SCVs will be over 30,000 gallons/day (per regasification train).

The NO_x emissions estimated in the draft EIS (Appendix E) for the Terminal when it reaches full operation are shown below in Table 1:

Table 1: Port Pelican Annual NO_x Emissions

Source Type	Annual NO_x Emissions (tons per year)
Tugboats	458
Support vessels	40
LNG tankers	426
Gas turbines (on terminal platform)	136
Diesel fired equipment – crane, forklift, cherry picker, fire pumps (on terminal platform)	68
Miscellaneous – flares, process vents, fugitives, glycol still vent (on terminal platform)	14
Total NO_x emissions:	1,142

The SCVs would emit a maximum of 240 tons/year of NO_x when the terminal reaches full operation.[5] However, the SCVs would actually be the cleanest air emission source on the Terminal. The one U.S. supplier of SCVs, T-Thermal Company, currently guarantees maximum NO_x emissions of 40 ppm at 5 percent O_2. This contrasts with the gas turbine NO_x emission guarantee of 67 ppm at 5 percent O_2.[6] The NO_x emission factors for the tugboat and support vessel diesel engines, the LNG tanker natural gas-fired engines, and Terminal diesel-fired equipment (see Air Emission Computation Factors, Appendix E) are 30 times or more the NO_x emission factor for the gas turbines, and 50 times the NO_x emission factor for the SCVs.

To some degree the NO_x emissions from the SCVs will be offset by the reduced power demand, and reduced NO_x emissions from power generation, at the Terminal. The twelve seawater lift pumps associated with the Terminal, at 650 hp each, represent a major component of Terminal electrical power demand.[7] The elimination of the seawater lift pumps by substituting SCV for ORV would result in a sizable reduction in Terminal electrical load and a proportionate reduction in the size of the gas turbines and associated air emissions. A potential option for reducing SCV fuel input and NO_x emissions further would be the use of the high temperature turbine exhaust gases, also known as "waste heat," as a supplemental heat source in the regasification process.

[5] Assumes 12 million cubic feet per day of natural gas combusted per LNG regasification train (2 trains total), natural gas heat content of 1,000 Btu/cubic foot, and 40 ppm NO_x at 5% O_2.
[6] Proposed gas turbines are GE LM2000 model units. GE Aero Energy Products advertises low-NO_x version of LM2000 gas turbine at 25 ppm at 15% O_2. This is equivalent to 67 ppm at 5% O_2.
[7] Six seawater lift pumps per train, two trains (pg. 2-13). Seawater lift pump horsepower identified as 650 hp in Table 4-9 (pg. 4-59).

The gas turbines as proposed will not be equipped with advanced catalytic NO_x control systems. The turbines could readily be equipped with cost-effective and highly reliable selective catalytic reduction (SCR) systems for NO_x control to partially offset NO_x emissions generated by the SCVs. Applying SCR to the gas turbines for NO_x control would reduce NO_x emissions by 120 tons/year or more.[8] Alternatively, the SCVs could potentially be equipped with SCR NO_x control, as has been done at the Distrigas LNG terminal in suburban Boston, to minimize NO_x emissions from the SCV process.

In reality the tugboats and supply vessels, with NO_x emissions of 500 tons/year, represent the biggest and possibly most cost-effective source of NO_x emission reductions. A relatively modest 50 percent reduction in NO_x emissions from these vessels would completely offset the NO_x emissions generated by the SCVs. There is a wide range of cost-effective NO_x control options available for marine vessels such as tugboats and supply vessels. As a case in point, the Texas Waterway Operators Association has agreed to voluntarily reduce NO_x emissions from tugboat, barge, and towing operations in the Houston-Galveston area. NO_x reductions of 400 tons/year will be achieved by 2007 through "clean diesel" engine retrofits, procedural changes to reduce idling time, and the use of new technologies (such as SCR) to reduce NO_x emissions.[9] SCR is in use on a number of marine vessels in Europe and the U.S.[10] The U.S. EPA states that "*equipping marine auxiliary and propulsion engines with SCR is generally thought to be technically feasible and reasonable in cost*."[11] Clearly there is a range of marine vessel NO_x control options available to compensate for NO_x emissions from the SCVs.

Summary

This comment letter is not an endorsement by the signing organizations of LNG import terminals as a part of the solution to our energy needs. However, if these facilities are being licensed in the U.S. they should meet the highest standards of environmental protection. The U.S. Coast Guard has been an exemplary steward of our coastal resources over the years. Requiring use of SCV at Port Pelican, or equivalent technology that does not use seawater for vaporization, will continue this tradition of stewardship. **We urge the U.S. Coast Guard to follow the precedent at existing U.S. LNG regasification terminals and require SCV, or equivalent technology that does not use seawater for vaporization, at the proposed Port Pelican offshore LNG terminal.**

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[8] The SCR can reduce NO_x emissions by 90 percent or more. SCR is now routinely applied to "simple cycle" gas turbines with high temperature exhaust gas such as those proposed for the Port Pelican terminal.
[9] Houston-Galveston Area Council, Fall 2001Clean Air Quarterly Newsletter article - *Texas Waterway Operators Association (TWOA) Volunteers NO_x Emission Reductions*, September 2001, www.cleanairaction.org.
[10] U.S. EPA, *Heavy-Duty Diesel Emission Reduction Retrofit/Rebuild Component*, EPA420-R-99-014, March 1999, pg. 72.
[11] Ibid.

Sincerely,

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